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MAR 16 2004

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re the Application of: GAUDET et al.) Examiner: Ernest G. THERKORN

Application Number: 09/944,064)

Group Art Unit: 1723

Filed: August 31, 2001)

Docket No.: 01048 (3600-297))

Confirmation No.: 8322

For: MATERIAL FOR CHROMATOGRAPHY

SUBMISSION OF APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 16, 2004

Sir:

Submitted herewith are an original and two copies of an Appeal Brief in the above-identified U.S. patent application. The filing fee of \$ 330.00 for submission of the Appeal Brief is enclosed.

In the event that any additional fees are due with respect to this paper, please charge Deposit Account No. 03-0060. This paper is filed in triplicate.

Respectfully submitted,
Kilyk & Bowersox, P.L.L.C.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: GAUDET et al.) Examiner: Ernest G THERKORN
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Application No.: 09/944,064)
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For: MATERIAL FOR CHROMATOGRAPHY

APPELLANTS' BRIEF ON APPEAL

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 16, 2004

Sir:

This is an appeal to the Board of Patent Appeals and Interferences (hereinafter, "the Board") from the Examiner's July 16, 2003 Final Office Action rejecting claims 1-10, 12, 13, 36, 39-43, and 46 in the above-identified application. The appealed claims are set forth in the attached Appendix.

I. THE REAL PARTIES IN INTEREST

The real party in interest, besides the named inventors, is Cabot Corporation.

II. RELATED APPEALS AND INTERFERENCES

No other appeal or interference which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal is known to the appellants or

the appellants' legal representative.

III. STATUS OF CLAIMS

The claims pending in the application are claims 1-46. Claims 11, 14-35, 37, 38, 44, and 45 were withdrawn due to a restriction requirement and an election of species requirement dated January 31, 2003.

In response to the restriction and election of species requirements, the appellants elected with traverse the subject matter of Group I, encompassing claims 1-13, 36, and 39-46 drawn to granulated products. Furthermore, the appellants, with regard to the election of species requirement, elected the combination of carbonized synthetic resin and carbonized pitch component and further elected the phenol resin as the specific synthetic resin and elected carbon black as the carbonaceous particle and elected toluene-soluble pitch components as the pitch component and elected a granulated product with attached organic groups as the granulated product. All of these elections were made with traverse.

A minor amendment to claim 3 (correcting an antecedent basis error) has been made by way of the Amendment submitted herewith.

A copy of the claims on appeal (including amended claim 3) can be found in the attached Appendix.

IV. STATUS OF AMENDMENTS

No response to the final Office Action dated July 16, 2003 was previously made. Entry of the present Amendment is respectfully requested.

V. SUMMARY OF INVENTION

There is always a continuing effort to improve the packing material for chromatographic separations. The disadvantages of the conventional packing material

include poor chemical stability, including solubility, and poor durability. (See e.g., page 1 of the present application). The claimed invention provides a solution to the above problems related to poor chemical stability, including solubility, and poor durability. The claimed invention, as discussed in detail below, relates to an improved liquid chromatographic packing material which does not require a high temperature heat-treatment or graphitization step. The claimed invention provides a granulated product having carbonaceous particles and the carbonized product of a carbonizable synthetic resin, pitch component, or both. Preferred granules include carbon black particles and a carbonized synthetic resin, pitch component, or both. The granulated product preferably has attached organic groups. (See e.g., pages 2-3, and 8 of the present application).

The claimed invention further provides a granulated product wherein a carbonized synthetic resin, carbonized pitch component, or carbonized synthetic resin/pitch component mixture has been carbonized by heating to a temperature of from about 400° C to less than 800° C. Optionally, the carbonaceous particles are mixed with at least one carbonizable binder and an aqueous solvent. (See e.g., page 7 of the present application).

In the claimed invention, the granulated product exhibits excellent mechanical durability and improved separating ability in chromatographic separation applications. Furthermore, the granulated product of the claimed invention is particularly useful in liquid chromatographic separation applications. (See e.g., the examples, and pages 9-10 of the present application).

VI. ISSUES

The issues remaining for review by the Board of Patent Appeals and Interferences are:

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- A. The Examiner's rejection of claims 1-10, 12, 13, and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. (U.S. Patent No. 5,270,280) in view of Mimori et al. (U.S. Patent No. 5,476,989).
- B. The Examiner's rejection of claims 1-10 and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. (International Published Application No. WO 95/01838) and Mikes et al. (Laboratory Handbook of Chromatographic and Allied Methods, pages 218-224 and 385-391).
- C. The Examiner's rejection of claims 12 and 13 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. and Mikes et al. and further in view of Mimori et al. or the Abstract of JP 54041296.
- D. The Examiner's rejection of claims 39-43 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Mimori et al. and further in view of Dias et al. (U.S. Patent No. 4,619,805).
- E. The Examiner's rejection of claims 39-43 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al. or the Abstract of JP 54041296, and further in view of Dias et al.
- F. The Examiner's rejection of claims 41 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Dias et al.
- G. The Examiner's rejection of claims 39, 40, 42, and 43 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Dias et al.

and further in view of either Mimori et al. or the Abstract of JP 54041296.

VII. GROUPING OF THE CLAIMS

As presently appealed, the groupings of the claims are as follows:

Claims 1-8, 10, 36, 42, and 43 stand or fall together;

Claim 9 stands or falls on its own;

Claim 12 stands or falls on its own;

Claim 13 stands or falls on its own;

Claim 39 stands or falls on its own;

Claim 40 stands or falls on its own;

Claim 41 stands or falls on its own; and

Claim 46 stands or falls on its own.

VIII. ARGUMENTS

A. The Examiner's rejection of claims 1-10, 12, 13, and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. (U.S. Patent No. 5,270,280) in view of Mimori et al. (U.S. Patent No. 5,476,989).

1. The Examiner's Rejection

At page 2 of the final Office Action, the Examiner rejects claims 1-10, 12, 13, and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. (U.S. Patent No. 5,270,280) in view of Mimori et al. (U.S. Patent No. 5,476,989). The Examiner states that the attachment of the organic group to the granulated product is not taught or suggested by Ichikawa et al. Furthermore, the Examiner states that claims 12 and 13 of the present application are not taught or suggested by Ichikawa et al. because claims 12 and 13 recite a temperature of less than 800° C to carbonize the components. However, the Examiner

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asserts that Mimori et al. describes that the use of functional groups of a carbonized adsorbent allows selectivity. The Examiner further asserts that Mimori et al. describes that carbonizing at 500° C allows carbon to become hydrophilic. Therefore, the Examiner concludes that it would have been obvious to one skilled in the art to combine the teachings of Mimori et al. with the teachings of Ichikawa et al. to form the product of the claimed invention.

At page 7 of the final Office Action, the Examiner responds to the appellants' arguments dated June 27, 2003, that Mimori et al. is not directed to chromatography. The Examiner asserts that the claims of the present application are directed to product claims and accordingly are not limited to chromatographic processes.

Furthermore, with respect to the appellants' arguments that Ichikawa et al. and Mimori et al. are directed to non-analogous art, the Examiner asserts that Ichikawa et al. and Mimori et al. are directed to separating agents. Accordingly, the Examiner states that the two references are not directed to non-analogous art.

In addition, with respect to the appellants' argument that Ichikawa et al. and Mimori et al. are not combinable, the Examiner states that Mimori et al., at column 2, lines 15-24, 53-56, column 4, lines 3-8, and line 60 – column 5, line 20, describes the use of functional groups of a carbonized adsorbent. Furthermore, the Examiner states that Mimori et al., at column 4, lines 4-10, describes that carbonizing at 500° C allows carbon to become hydrophilic. Accordingly, the Examiner concludes that motivation exists to use functional groups in Ichikawa et al. Furthermore, the Examiner concludes that motivation exists to carbonize Ichikawa et al. at 500° C.

For the following reasons, the Examiner's rejection should be reversed.

2. The Appellants' Reply to the Examiner's rejection of claims 1-10, 12, 13, and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. (U.S. Patent No. 5,270,280) in view of Mimori et al. (U.S. Patent No. 5,476,989).

a) The patentability of claims 1-8, 10, and 36.

Claim 1 recites a granulated product comprising carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, or mixtures thereof, wherein the granulated product has attached at least one organic group.

Claim 2 is dependent on claim 1, and recites that the carbonaceous particles have a specific surface area of from about 15 to about 550 m²/g and a total micropore volume of from about 0.01 to about 2.0 ml/g.

Claim 3 is dependent on claim 1, and recites that the granulated product has a ratio V_{0.5}/V_{1.0} of about 0.4 or smaller, wherein V_{0.5} is the nitrogen gas adsorption volume of a relative pressure P/P₀ of 0.5 and V_{1.0} is the nitrogen gas adsorption volume at a relative pressure P/P₀ of about 1.0 at a nitrogen gas adsorption isotherm.

Claim 4 is dependent on claim 1, and recites that the carbonaceous particles are carbon black particles.

Claim 5 is dependent on claim 1, and recites that the granulated product includes a carbonized synthetic resin and the synthetic resin is a phenol resin, a furan resin, a furfural resin, a divinyl benzene resin, a urea resin, or a combination thereof.

Claim 6 is dependent on claim 1, and recites that the granulated product includes a carbonized pitch component and the pitch component is at least one of a toluene-soluble pitch component or a benzene-soluble pitch component, or a combination thereof.

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Claim 7 is ultimately dependent on claim 1, and recites that the pitch component includes a petroleum pitch, a coal-tar pitch, a liquefied coal oil, or a combination thereof.

Claim 8 is dependent on claim 1, and recites that the carbonaceous particles include 100 parts by weight carbon black and the mixture includes from about 5 to about 500 parts by weight the synthetic resin, pitch component, or both.

Claim 36 is dependent on claim 1, and recites that the granulated product has a ratio L_{\min}/L_{\max} of a minor axis diameter L_{\min} to a major axis diameter L_{\max} of from about 0.75 to about 1.25, a particle diameter from about 2 to about 200 microns, a specific surface area of from about 10 to about 650 m^2/g , and a total micropore volume of from about 0.08 to about 2.0 ml/g .

Ichikawa et al. relates to the use of carbon black packing materials for liquid chromatography, wherein the carbon blacks have specific dimensional ratios, specific particle diameters and surface areas, and specific micropore volumes.

Mimori et al. relates to an adsorbent for the adsorption of radionuclides and to a process for the volume-reduction treatment of radioactive fuel that contains radionuclides. Mimori et al. simply does not relate to a packing material for liquid chromatography or a method of manufacture thereof. Mimori et al. is non-analogous art. Therefore, one skilled in the art would not combine Ichikawa et al. and Mimori et al. The only way the Examiner could possibly look to Mimori et al. is with the improper use of hindsight.

Claim 1 of the present application relates to a granulated product which comprises carbonaceous particles and at least one carbonized synthetic resin or carbonized pitch component or mixtures thereof. The granulated product also has attached at least one

organic group. The carbonization treatment mentioned by the Examiner at column 4 of Mimori et al. relates to the carbonization of active carbon alone. No granulated product is mentioned in Mimori et al.; only a fibrous active carbon. Also, no carbonized synthetic resin or carbonized pitch component or mixtures thereof is mentioned in Mimori et al. Mimori et al. only mentions the carbonization treatment of the active carbon. Mimori et al. significantly differs from Ichikawa et al. which relates to a packing material that contains carbon black and a mixture of synthetic resin and other components. Thus, given that the products, technologies, and uses of Ichikawa et al. and Mimori et al. differ, one skilled in the art could not conceivably apply the carbonization treatment of fibrous active carbon of Mimori et al. to a completely different product such as one in Ichikawa et al.

Furthermore, with respect to the Examiner's reliance on Mimori et al. for an attached organic group, as mentioned above, first, Mimori et al. is not combinable with Ichikawa et al. for the reasons set forth above. Second, the granulated product of the claimed invention has attached at least one organic group. Mimori et al. does not show a granulated product nor an organic group attached to any granulated product. Thus, again Mimori et al. alone or even combined with Ichikawa et al., if possible, does not teach or suggest the claimed invention.

With respect to the Examiner's argument that the claims of the present application are directed to product claims and accordingly are not limited to chromatographic processes, the Examiner's argument does not explain why Ichikawa et al. can be combined with Mimori et al.

It is not proper to combine references unless there is something in the prior art suggesting the desirability of such a combination. The “critical inquiry” in combining various prior art references is whether there is something in the prior art as a whole that suggests the desirability, and thus the obviousness, of making the combination of those references. When an Examiner relies on two or more references to reject the claimed invention, the Examiner bears the burden of showing some teaching or suggestion in the references which support their use in combination. Ichikawa et al. relates to packing materials for liquid chromatography and a method of manufacture thereof. Mimori et al. relates to adsorption of radioactive nuclides and a process for volume-reduction treatment of radioactive waste. Thus, given that Mimori et al. and Ichikawa et al. are not related, they do not suggest the desirability, and thus the obviousness to be combined.

With respect to the Examiner’s arguments that Ichikawa et al. and Mimori et al. are directed to separating agents, and thus the two references are analogous, the Examiner cannot simply ignore the actual materials described in each reference and their intended use. The materials are different, one is granulated and one is fibrous non-granulated, one is for radioactive nuclides and one is for liquid chromatography. The technologies are very different. One is carbon black and one is fibrous active carbon. The differences are many. Only hindsight and an obvious to try standard would explain why one would combine these references. No person skilled in the art would modify the material of Ichikawa et al. by looking to fibrous active carbon which is a chemically different material. Thus, one skilled in the art would not be motivated to combine the two references.

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Ichikawa et al. and Mimori et al. do not teach the claimed invention as recited in claims 1-8 and 36 of the present application, and this rejection should be reversed.

b) The patentability of claim 9.

Claim 9 is dependent on claim 1, and recites that the organic group contains an ionic group or an ionizable group.

The reasons set forth above with respect to the patentability of claim 1 apply equally here, and the arguments are incorporated in their entirety by reference herein. In particular, Ichikawa et al. and Mimori et al. relate to completely different products, technologies, and uses; therefore, one skilled in the art would not possibly apply the carbonization treatment of fibrous active carbon on Mimori et al. to a completely different product, such as one described in Ichikawa et al.

Additionally, Ichikawa et al. makes no references to having an organic group and certainly not an organic group that contains an ionic group or an ionizable group.

Furthermore, Mimori et al. does not teach or suggest that its functional group contains an ionic group or an ionizable group. Thus, assuming *arguendo*, even if one skilled in the art would combine Ichikawa et al. with Mimori et al., the combination of the two references still does not teach or suggest an organic group that contains an ionic group or an ionizable group as recited in claim 9 of the present application. Accordingly, this rejection should be reversed.

c) The patentability of claim 12.

Claim 12 is dependent on claim 1, and recites that the carbonized synthetic resin, carbonized pitch component, or carbonized synthetic resin/pitch component mixture has been carbonized by heating to a temperature of from about 400° C to less than 800° C.

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The reasons set forth above with respect to the patentability of claim 1 apply equally here, and the arguments are incorporated in their entirety by reference herein. In particular, Ichikawa et al. makes no references to having an organic group and Ichikawa et al. and Mimori et al. are non-analogous art and are not combinable.

The methods of making the packing material according to Ichikawa et al. include granulating a carbon black-containing mixture and heat-treating the granules at a high temperature in the range of from 800 to about 3000° C, in an inert atmosphere. The high temperature heat-treatment is most likely necessary to carbonize and graphitize the binder material in order to form a graphitic layer. According to Ichikawa et al., at column 5, lines 60-68 and column 6, lines 38-41, if the temperature is below 800° C, the graphitization (carbonization) of the binder is not sufficient, resulting in the packing material having insufficient strength. Ichikawa et al., without any ambiguity, instructs one not to heat treat the granules below 800° C.

Ichikawa et al. specifically states that if the temperature is below 800° C, the carbonization of the binder is not sufficient; thus resulting in the packing material having insufficient strength. Moreover, the Examiner's reference to column 4 of Mimori et al., and subjecting the active carbon to carbonization treatment at a temperature of from 500 to 1000° C needs to be explained. The Examiner attempts to argue that it would be obvious to use a lower temperature in Ichikawa et al. by relying on Mimori et al. However, the very paragraph relied upon by the Examiner, namely in column 4 of Mimori et al. is misinterpreted and misapplied to Ichikawa et al. First of all, it is important to realize that claim 1 relates to a granulated product which comprises carbonaceous particles and at least one carbonized synthetic resin or carbonized pitch

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component or mixtures thereof. The granulated product also has attached at least one organic group. The carbonization treatment mentioned by the Examiner at column 4 of Mimori et al. relates to the carbonization of fibrous active carbon alone. There is no granulated product mentioned in Mimori et al., only a fibrous active carbon. Also, there is no carbonized synthetic resin or carbonized pitch component or mixtures thereof. Mimori et al. only mentions the carbonization treatment of the fibrous active carbon. This is very different from Ichikawa et al. which relates to a packing material which contains carbon black and a mixture of synthetic resin and other components. Thus, one skilled in the art could not possibly apply the carbonization treatment of fibrous active carbon to a completely different product in Ichikawa et al. The Examiner has not explained how one skilled in the art could do so especially in view of different products, different technologies, and different uses.

With respect to the Examiner's argument that Mimori et al. and Ichikawa et al. are combinable because Mimori et al., at column 2, lines 15-24, 53-56, column 4, lines 3-8, and line 60 - column 5, line 20, describes the use of functional groups of a carbonized adsorbent, and further describes that carbonizing of the granules at 500° C allows carbon to become hydrophilic, the Examiner's argument is simply incorrect.

In response, the Examiner cannot simply make the disclosure of Mimori et al. generic when Mimori et al. specifically states that fibrous active carbon alone is subjected to a carbonization treatment at a temperature of from 500 to 1000°C. The material of Mimori et al. is quite different from the granulated product of Ichikawa et al. which is a combination of carbon black and a resin or pitch component. As hopefully the Board should appreciate, carbon black is not the same and not even close to fibrous active carbon. Second, a packing

material which is a granulated mixture of resin and pitches and carbon black is quite different from fibrous active carbon alone. How someone skilled in the art can take a leap from functionalizing a fibrous active carbon and do the same with a completely different product, which is not only different with respect to it being carbon black, but is also different overall with respect to it being a granulated packing material is not understood. Clearly the technologies are quite different.

Since the materials are quite different, what Mimori et al. may teach simply is not applicable to the packing material of Ichikawa et al. where the materials are different. One cannot easily apply different processing parameters or different chemistry to a different material.

Accordingly, Ichikawa et al. in view of Mimori et al. does not teach or suggest claim 12 of the present application, and this rejection should be reversed.

d) The patentability of claim 13.

Claim 13 is dependent on claim 1, and recites that the carbonized synthetic resin, carbonized pitch component, or carbonized synthetic resin/pitch component mixture has been carbonized by heating to a temperature of from about 400° C to about 700° C.

The reasons set forth above with respect to the patentability of claim 12 apply equally here, and the arguments are incorporated in their entirety by reference herein. In particular, Ichikawa et al. makes no references to having an organic group, and Ichikawa et al. and Mimori et al. are non-analogous art and are not combinable. As noted, Ichikawa et al. teaches away from carbonizing at a temperature less than 800° C; therefore, one skilled in the art would not be motivated to combine Ichikawa et al. with Mimori et al. In addition, the granulated product of the claimed invention has attached at least one organic

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group. Mimori et al. does not show a granulated product nor an organic group attached to any granulated product. Thus, again, Mimori et al. alone or even combined with Ichikawa et al., if this is possible, does not teach or suggest the claimed invention.

Ichikawa et al. teaches away from Mimori et al. by stating that at temperatures below 800° C, carbonization of the binder is not sufficient, resulting in the packing material having insufficient strength. One skilled in the art would not conclude that at temperatures below 800° C, the packing material would have sufficient strength. There is no way Mimori et al. could modify Ichikawa et al. in view of the different technologies. Further, the lower temperatures of Mimori et al. were not concerned with making granulated packing material for liquid chromatography. Thus, one would not alter the clear and strict guidance set forth in Ichikawa et al. Accordingly, Ichikawa et al., Mimori et al., or the combination thereof does not teach or suggest claim 13 of the present application, and this rejection should be reversed.

B. The Examiner's rejection of claims 1-10 and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. (International Published Application No. WO 95/01838) and Mikes et al. (Laboratory Handbook of Chromatographic and Allied Methods, pages 218-224 and 385-391).

1. The Examiner's Rejection

At pages 2-3 of the final Office Action, the Examiner rejects claims 1-10 and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. (WO 95/01838) and Mikes et al., *Laboratory Handbook of Chromatographic and Allied Methods*, pages 218-224 and 385-391. The

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Examiner acknowledges that Ichikawa et al. does not teach or suggest attaching at least one organic group to the granulated product. However, the Examiner asserts that the Abstract of JP 02193066 shows binding functional groups to carbon particles and Holmes et al. shows that binding functional groups to carbon chromatography material enhances the selectivity of the adsorbent. Furthermore, the Examiner asserts that Mikes et al. shows that affinants/functional groups are added to selectively adsorb substances. Therefore, the Examiner concludes that Ichikawa et al. in view of JP 02193066 or Holmes et al. and Mikes et al. teaches the claimed invention.

At page 8 of the final Office Action, the Examiner responds to the appellants' arguments dated June 27, 2003, that the Abstract of JP 02193066 does not teach functional groups. The Examiner asserts that the title of the Abstract states "activated carbon with non-polar or polar functional groups." The Examiner also states that the body of the Abstract states "carboxyl groups" which are a polar functional group and octadecyl groups which are a non-polar functional groups. The Examiner then concludes that since the Abstract of JP 02193066 describes binding functional groups to carbon particles and Mikes et al. describes that affinants/functional groups are added to selectively adsorb substances, one skilled in the art would be motivated to use a functional group in Ichikawa et al.

Additionally, in response to the appellants' arguments that the Abstract of JP 02193066 is not a proper reference, the Examiner states that the Abstract of JP 02193066 was submitted by the appellants in their March 7, 2003 IDS and that MPEP 706.02 does not preclude the use of abstracts.

Furthermore, with respect to the appellants' arguments that Holmes et al. and Mikes et al. do not provide motivation for the use of an organic group in Ichikawa et al., the Examiner asserts that Holmes et al. states that binding functional groups to carbon chromatography material enhances the selectivity of the adsorbent. The Examiner also states that Mikes et al. describes that affinants/functional groups are added to selectively adsorb substances. Thus, the Examiner concludes that motivation exists to use a functional group in Ichikawa et al.

For the following reasons, the Examiner's rejection should be reversed.

2. The Appellants' Reply to the Examiner's rejection of claims 1-10 and 36 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. (International Published Application No. WO 95/01838) and Mikes et al. (Laboratory Handbook of Chromatographic and Allied Methods, pages 218-224 and 385-391).

a) The patentability of claims 1-8, 10, and 36.

As stated earlier, claim 1 relates to a granulated product including carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, or mixtures thereof, wherein the granulated product has attached at least one organic group.

The arguments set forth above with respect to claim 1 and Ichikawa et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

Ichikawa et al. does not teach or suggest a granulated product that has attached at least one organic group. Also, it is the undersigned's understanding that the PTO has recently instructed Examiners not to rely on abstracts of foreign language references but

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to instead rely on a complete English translation of the document. *See Ex parte Bonfils*, 64 U.S.P.Q.2d 1456, 1460 (Bd. Pat. App. and Int. 2002) (unpublished opinion). The Examiner was requested to provide a complete English version, but has not agreed to do so. Further, JP 02193066 relates to a particulate activated charcoal which is anisotropic and produced from particles with a particle size of less than 80 μm in more than 90% of the total while composed of micropores with a diameter of less than 20 angstroms in more than 85% of the total capacity. JP 02193066 simply does not teach or suggest carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, and mixtures thereof, wherein the granulated product has directly attached at least one organic group. Ichikawa et al. uses carbon black and the Examiner provides no reasons why one skilled in the art would substitute the carbon black of Ichikawa et al. with the activated charcoal of JP 02193066. One skilled in the art would recognize that a clear difference exists between carbon black and activated charcoal. Clearly, carbon black and activated charcoal are made from different materials, promote different properties, and are used differently. In addition, the carbon black used in Ichikawa et al. is used in combination with other components to form the granulated product. The activated charcoal in JP 02193066 is not used with any other component and is not a granulated product. Simply, the materials of each reference cannot be easily substituted except through the improper use of hindsight. In addition, no consideration has been provided by the Examiner on whether the particulate activated charcoal of the Japanese reference would sustain the processing steps of Ichikawa et al. including the high temperature of 800° or more.

Also, no teaching or suggestion is made in the Abstract of JP 02193066 that any functional groups are attached to the activated charcoal. The reference to functional groups and where they are present with respect to the charcoal is not clear. Furthermore, as explained above with respect to the earlier rejection, the present application, in claim 1, states that the organic group is attached to the granulated product. The attachment of the organic group to the granulated product is clearly not shown in JP 02143066, given that the Abstract of JP 02193066 does not relate to any granulated product such as one recited in claim 1 of the present application.

Holmes et al. relates to a method for producing modified activated carbon materials wherein a nucleophilic agent is reacted with a halogenated carbon to result in an activated carbon having an associated moiety such as an amino, thiol sulphonic or other sulfur oxide, halogen, carboxy, keto, aldehyde, or heterocyclic ring group associated with the carbon. Holmes et al., at page 3, lines 4-15, states that the precise nature of the association of the agent with the activated carbon, and displacement of halogen, has not yet been elucidated and that it is uncertain whether any halogen is retained as a salt with the nucleophilic agent or whether it is lost under vacuum. As with the other secondary references, Holmes et al. relates to an activated carbon material. As one skilled in the art knows, activated carbon is not the same as carbon black as used in Ichikawa et al. Again, one skilled in the art would not readily substitute activated carbon for carbon black given that the two materials are quite different from each other with respect to properties and the manner in which they are made. Thus, Holmes et al. is not combinable with Ichikawa et al. just as the Abstract of JP 02193066 described above is not combinable with Ichikawa et al. Furthermore, any functional groups, which are involved with the activated

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carbon of Holmes et al., differ from a granulated product having an attached organic group as recited in claim 1 of the present application. Regardless of the interaction or association, Holmes et al. fails to teach or suggest a modified carbonaceous adsorbent composition wherein an organic group is attached to the granulated product, as recited in the claimed invention.

Mikes et al., in general, relates to ion exchange chromatography and affinity chromatography. Mikes et al. does not teach or suggest any carbonaceous material. Furthermore, the ionic exchange referred to in Mikes et al. does not seem to mention or even suggest carbon black similar to that used in Ichikawa et al. Carbon black is not considered an ionic exchanger. Thus, again, like the other secondary references, Mikes et al. is not combinable with Ichikawa et al. given that Ichikawa et al. relates to a material that includes carbon black and not "ionic exchangers" as used in Mikes et al. Furthermore, no motivation exists to make such a substitution, when Ichikawa et al. does not suggest other materials and Mikes et al. does not teach or suggest using such ionic exchangers in the type of material set forth in Ichikawa et al.

In addition, Mikes et al. may describe functional groups but not attached to a granulated product as recited in claim 1 of the present application. Therefore, Mikes et al. does not teach or suggest granulated products having carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, or mixtures thereof, wherein the granulated product has directly attached at least one organic group.

The Examiner argues that since the Abstract of JP 02193066 describes binding functional groups to carbon particles and Mikes et al. describes that affinants/functional groups are added to selectively adsorb substances, one skilled in the art would be

motivated to use a functional group in Ichikawa et al., as noted above. However, JP 02193066 relates to a particulate activated charcoal, whereas Ichikawa et al. relates to a carbon black, which significantly differs from an activated charcoal. Given that carbon blacks and activated charcoals have different properties and characteristics, one skilled in the art would not be motivated to combine the two references. Further, Ichikawa et al. is a granulated product and the secondary references are not. The materials are quite different. Where is the motivation to substitute carbon black for charcoal. Or, how would a functional group on just charcoal work in the same manner as a granulated product having carbon black and a binder?

With respect to the Examiner's argument that MPEP 706.02 does not preclude the use of abstracts, according to *Ex parte Bonfils*, 64 U.S.P.Q.2d. 1456, 1460 (Bd. Pat. App. and Int. 2002) (unpublished opinion), when the Examiner relies on a document that is in a foreign language, the Examiner bears the burden of providing an English translation. It is respectfully noted that the Examiner relied upon the reference for asserting unpatentability, not appellants.

With respect to the Examiner's argument that Holmes et al. states that binding functional groups to carbon chromatography material enhances the selectivity of the adsorbent and that Mikes et al. describes that affinants/functional groups are added to selectively adsorb substances, and thus motivation exists to use a functional group in Ichikawa et al., the Examiner is simply incorrect. As stated previously, combining various references depends on whether something in the prior art as a whole suggests the desirability, and thus the obviousness, of making the combination of the references. As noted, Holmes et al. relates to a method for producing modified activated carbon

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materials and Mikes et al. relates to ion exchange and affinity chromatography and does not suggest carbon blacks (or granulated products with carbon black) similar to that used in Ichikawa et al. Thus, no motivation exists to use the functional group of Holmes et al. in Ichikawa et al.

In sum, the combination of the references does not teach or suggest a granulated product having carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, or mixtures thereof, wherein the granulated product has at least one organic group. Accordingly, Ichikawa et al., in view of either the Abstract of JP 02193066 or Holmes et al. and Mikes et al. does not teach or suggest claims 1-8, 10, and 36 of the present application, and this rejection should be reversed.

b) The patentability of claim 9.

As stated previously, claim 9 is dependent on claim 1, and recites that the organic group contains an ionic group or an ionizable group.

The arguments set forth above with respect to the patentability of claim 9 over Ichikawa et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

As noted, Ichikawa et al. does not teach or suggest an organic group attached to the granulated product and certainly not an organic group that contains an ionic group or an ionizable group. One skilled in the art would not be motivated to use or substitute the activated charcoal of JP 02193066 with the carbon black in Ichikawa et al. for use in a granulated product, especially when the two materials are different and the JP reference doesn't relate to a granulated product. Also, no full English translation of the JP reference has been provided.

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With respect to Holmes et al., Holmes et al. relates to activated carbon material. As noted above, activated carbon is not the same as carbon black as used in Ichikawa et al. Therefore, one skilled in the art would not readily substitute activated carbon of Holmes et al. with carbon black of Ichikawa et al. Also, Holmes et al. does not relate to a granulated product. Therefore, Holmes et al. is not combinable with Ichikawa et al.

With respect to Mikes et al., as argued above, Mikes et al. is not combinable with Ichikawa et al. Mikes et al. simply does not teach or suggest granulated products which has attached at least one organic group and more specifically an organic group which contains an ionic group or an ionizable group. Accordingly, Ichikawa et al. in view of the Abstract of JP 02193066 or Holmes et al. and Mikes et al. does not teach or suggest claim 9 of the present application, and this rejection should be reversed.

C. The Examiner's rejection of claim 12 and 13 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. and Mikes et al. and further in view of Mimori et al. or the Abstract of JP 54041296.

1. The Examiner's Rejection

The Examiner acknowledges that the claims of the present application differ from Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. and Mikes et al. The Examiner states that Ichikawa et al. in view of the Abstract of JP 02193066 or Holmes et al. and Mikes et al. does not teach or suggest heating the granules at a temperature of less than 800° C. However, the Examiner asserts that Mimori et al. shows that carbonizing at 500° C allows carbon to become hydrophilic. Furthermore, the Examiner asserts that the Abstract of JP 54041296 shows that heating carbon black and a

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carbonizable binder at 500° C forms a support useful for adsorption. Accordingly, the Examiner concludes that it would have been obvious to use a temperature of less than 800° C in Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. and Mikes et al.

At page 9 of the final Office Action, the Examiner responds to the appellants' argument dated June 27, 2003, that neither Mimori et al., the Abstract of JP 54041296, nor the combination thereof provides motivation to use a temperature of less than 800° C to heat the granules. The Examiner asserts that Mimori et al., at column 4, lines 4-10, describes that the carbonizing at 500° C allows carbon to become hydrophilic. Furthermore, the Examiner asserts that the Abstract of JP 54041296 describes that heating carbon black and a carbonizable binder at 500° C forms a support useful for adsorption. Thus, the Examiner concludes that since Mimori et al. describes that carbonizing at 500° C allows carbon to become hydrophilic and the Abstract of JP 54041296 describes that heating carbon black and a carbonizable binder at 500° C forms a support useful for adsorption, one skilled in the art would be motivated to use a temperature of less than 800° C in Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al., and Mikes et al.

Furthermore, with respect to the appellants' argument that the Abstract of JP 54041296 is not a proper reference, the Examiner states that the Abstract of JP 54041296 was submitted by the appellant in their March 7, 2003 IDS and that MPEP 706.02 does not preclude the use of abstracts as prior art to reject the claimed invention.

For the following reasons, the Examiner's rejection should be reversed.

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2. The Appellants' Reply to the Examiner's rejection of claims 12 and 13 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al. and Mikes et al. and further in view of Mimori et al. or the Abstract of JP 54041296.

- a) The patentability of claim 12.

As noted, claim 12 is dependent on claim 1, and recites that the carbonized synthetic resin, carbonized pitch component, or carbonized synthetic resin/pitch component mixture has been carbonized by heating to a temperature of from about 400° C to less than 800° C.

The arguments set forth above with respect to the patentability of claim 1 over Ichikawa et al., the Abstract of JP 02193066 or Holmes et al., and Mikes et al., and claim 12 over Ichikawa et al. in view of Mimori et al. apply equally here, and the arguments are incorporated in their entirety by reference herein. In particular, as noted, one skilled in the art would not combine Ichikawa et al. with Mimori et al., the Abstract of JP 02193066, Holmes et al., or Mikes et al.

The Abstract of JP 54041296 shows granulating carbon black into spheres and dipping the spheres in a solution of a carbonizable binder such as phenol formaldehyde resin, in a solvent such as acetone, showing a carbonization yield of more than 10% by calcination under an inert atmosphere at 500-1200° C. Ichikawa et al. teaches away from the Abstract of JP 54041296 by stating that carbonization below 800° C is not sufficient and will result in a packing material having insufficient strength. Therefore, one skilled in the art would not look to JP 54041296 when reading Ichikawa et al. Even if one skilled in the art looked to JP 54041296, one would not modify Ichikawa et al. since Ichikawa et al.

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gives very strict instructions not to go below 800° C with respect to the type of product set forth in Ichikawa et al. Also, it is respectfully pointed out that unlike Ichikawa et al., JP 54041296 simply coats a granulated carbon black with a particular resin. Ichikawa et al. on the other hand specifically mixes carbon black with a synthetic resin to form a mixture, which is then subjected to the remaining processing steps of Ichikawa et al. Thus, the Examiner's attempt to argue that it would be easy to use the temperatures of JP 54041296 in Ichikawa et al. has not taken into account the major differences between the products of JP 54041296 and Ichikawa et al. This taken into account and with the strict warnings provided by Ichikawa et al., one skilled in the art could not possibly combine JP 54041296 with Ichikawa et al. and the other secondary references. Furthermore, the combination of the references does not teach or suggest at least one organic group being attached to the granulated product. As stated above, the combination of references is not possible, and even if combinable, the combination does not teach or suggest the claimed invention. Furthermore, the comments above with respect to the reliance on abstracts would apply to the use of JP 54041296 as well.

With respect to the Examiner's argument that one skilled in the art would be motivated to use a temperature of less than 800° C in Ichikawa et al. due to Mimori et al. which describes carbonizing at 500° C and the Abstract of JP 54041296 which describes heating carbon black and a carbonizable binder at 500° C, Ichikawa et al. teaches away from low temperatures by providing very strict instructions not to go below 800° C with respect to the type of product set forth in Ichikawa et al. If the exact same materials were used in all of the references, the Examiner's attempt at a substitution might have some merit. However, as explained above, the granulated product of Ichikawa et al. is quite

different from the secondary references relied upon by the Examiner and the Examiner has not taken into account the differences from a chemical and physical point of view. It is clear that the Examiner is only using hindsight to make the substitution in order to assert that one could carbonize by heating at a temperature of from about 400°C to less than 800° C. There is no motivation shown in the references for the Examiner to modify Ichikawa et al. in the manner argued by the Examiner.

With respect to the Examiner's argument that MPEP 703.02 does not preclude the use of abstracts, as noted previously, if the Examiner relies on a document that is in a foreign language, the Examiner bears the burden of providing an English translation.

Accordingly, this rejection should be reversed.

b) The patentability of claim 13.

Claim 13 is dependent on claim 1, and recites that the carbonized synthetic resin, carbonized pitch component, or carbonized synthetic resin/pitch component mixture has been carbonized by heating to a temperature of from about 400° C to less than 700° C.

The arguments set forth above with respect to the patentability of claim 12 over Ichikawa et al., in view of either the Abstract of JP 02193066 or Holmes et al., Mikes et al. and further in view of Mimori et al. or the Abstract of JP 54041296, apply equally here, and the arguments are incorporated in their entirety by reference herein.

Claim 13 recites an even lower carbonized heating temperature. Even more so, the cited references would not teach or suggest this temperature range especially since Ichikawa et al. warns against going below 800° C. As stated above, the secondary references are not combinable with Ichikawa et al., and even if combinable, the combination does not teach or suggest carbonized synthetic resin, carbonized pitch

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component, or carbonized synthetic resin/pitch component mixture as being carbonized by heating to a temperature of from about 400° C to less than 700° C. Accordingly, this rejection should be reversed.

D. The Examiner's rejection of claims 39-43 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Mimori et al. and further in view of Dias et al. (U.S. Patent No. 4,619,805).

1. The Examiner's Rejection

The Examiner acknowledges that the claimed invention differs from Ichikawa et al. in view of Mimori et al. The Examiner admits that Ichikawa et al. in view of Mimori et al. does not teach or suggest the use of aqueous solvent. However, the Examiner asserts that Dias et al. shows that the use of water allows carbon particles to be coated with binders and is used with phenolic resin. Accordingly, the Examiner concludes that it would have been obvious to use water in Ichikawa et al. in view of Mimori et al.

At page 10 of the final Office Action, the Examiner responds to the appellants' argument dated June 27, 2003, that Dias et al. does not provide motivation to use an aqueous solvent in Ichikawa et al. In response, the Examiner states that the claims are directed to product claims. Accordingly, the claims are considered to read on the product of Ichikawa et al. without motivation to use an aqueous solvent. The Examiner further states that Dias et al. describes that the use of water allows carbon particles to be coated with binders and is used with phenolic resin. Thus, the Examiner concludes that a motivation exists to use water in Ichikawa et al.

For the following reasons, the Examiner's rejection should be reversed.

2. The Appellants' Reply to the Examiner's rejection of claims 39-43 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Mimori et al. and further in view of Dias et al. (U.S. Patent No. 4,619,805).

a) The patentability of claim 39.

Claim 39 recites a granulated carbonaceous product comprising carbonaceous articles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules at a temperature of from about 400° C to less than 800° C.

The arguments set forth above with respect to the patentability of claim 1 over Ichikawa et al. and Mimori et al. apply equally here, and the arguments are incorporated in their entirety by reference herein. As stated, Ichikawa et al. strictly warns against carbonizing at a temperature below 800° C and Mimori et al. is not combinable with Ichikawa et al. due to different materials and different products being formed. Clearly, there is no motivation, when Ichikawa et al. is read in its entirety, to modify its process and to substitute different types of materials as set forth in Mimori et al. Furthermore, since Ichikawa et al. specifically indicates that carbonizing at temperatures below 800° C make a different and unacceptable product, it is clear that the conditions set forth in claim 39 does affect the product formed and even Ichikawa et al. admits that different products would form using different conditions. The Examiner has provided no evidence to the contrary to show that the same product would form. Certainly none of the cited references relied upon by the Examiner would indicate that the same product as set forth in claim 39 using the conditions

set forth in claim 39 would result. As it stands, the evidence shows, as in Ichikawa et al., that temperature does affect the type of product that is formed.

Dias et al. relates to a method of producing porous carbon bodies of high permeability. According to Dias et al., at column 2, carbon particles are suspended in a first liquid in which, after the suspension is made, a binder is wholly or partially dissolved. The first liquid and its dissolved and suspended substances are then introduced into a second liquid which is miscible with the first, but in which the binder is either insoluble or soluble only with difficulty. The suspended carbon particles are coated with the binder, settle, and form a muddy mass, which is then freed of supernatant liquid and thereafter dried. Dias et al. does not relate to packing material for liquid chromatography.

Therefore, one skilled in the art would not be motivated to look to Dias et al. to overcome the deficiencies of Ichikawa et al.

Furthermore, Ichikawa et al., for instance at column 5, specifically states that in order to homogenize the carbon black in the binder, it is necessary, in a preferred embodiment, to disperse them in a suitable dispersing agent which is a solvent having good wettability with either the carbon black and binder. Thus, the teaching of Ichikawa et al. is the complete opposite of the teaching of Dias et al. which encourages one to suspend carbon particles and a binder in water.

With respect to the Examiner's argument that Dias et al. describes that the use of water allows carbon particles to be coated with binders, Dias et al. relates to producing porous carbon bodies of high permeability, and Dias et al. does not relate to a packing material for liquid chromatography. In contrast, Ichikawa et al. specifically recites a packing material for liquid chromatography. Thus, one skilled in the art would not be

motivated to combine the two references.

Clearly, the teachings of Dias et al. are the opposite of Ichikawa et al. and thus one skilled in the art would not combine the two teachings. Accordingly, this rejection should be reversed.

b) The patentability of claim 40.

Claim 40 is dependent on claim 39, and recites that the carbon particles are carbon black and the carbonizable binder is a water-compatible phenolic resin, and wherein the mixture includes 100 parts by weight of carbon black and from about 5 to about 100 parts by weight of the carbonizable binder.

The arguments set forth above with respect to the patentability of claim 39 over Ichikawa et al., Mimori et al., and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

With respect to the carbonizable binder that is a water-compatible phenolic resin, Ichikawa et al. only describes the use of a phenol resin. Phenolic resins differ from phenol resins. A phenolic resin is any of several types of synthetic thermosetting resins obtained by the condensation of phenol or substituted phenols with aldehydes. Ichikawa et al. does not teach or suggest use of a phenol resin in combination with an aldehyde such as formaldehyde or acetaldehyde. Even if the phenol in Ichikawa et al. was combined with another resin such as a furfural resin to possibly produce a phenolic resin, the combination of Ichikawa et al., Mimori et al., and Dias et al. does not teach or suggest claim 40 of the present application. Accordingly, Ichikawa et al., Mimori et al., Dias et al., or even the combination thereof, if possible, does not teach or suggest claim 40 of the present application. Thus, this rejection should be reversed.

c) The patentability of claim 41.

Claim 41 relates to granulated carbonaceous product including carbonaceous particles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules, wherein the mixture includes 100 parts by weight of carbon black and from about 5 to less than 50 parts by weight of at least one carbonizable binder.

The arguments set forth above with respect to the patentability of claims 39 and 40 over Ichikawa et al., Mimori et al., and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

Furthermore, Ichikawa et al. describes that the binder compositions are mixed within a range of 1.0 to 3.0 parts by weight per 1.0 part by weight of carbon black. Furthermore, Ichikawa et al., at column 5, lines 4-9 states that if the binder is below 1.0 parts by weight, the mechanical strength of the packing material obtained is insufficient. If the binder is above 3.0 parts by weight, it is not preferable in that the micropore volumes that are effective in separation become insufficient. In contrast, claim 41 of the present application recites that the mixture includes 100 parts by weight of carbon black and from about 5 to less than 50 parts by weight of at least one carbonizable binder. In summary, the ratio of carbon black to binder composition in Ichikawa et al. is from 1:1-1:3, whereas the weight ratio of carbon black to carbonized binder according to claim 41 of the present application is 1:0.05-1:0.5. The Examiner has provided no reasoning on why the combination of references, even if possible, would teach or suggest the subject matter of claim 41. Clearly, Ichikawa et al. teaches away from the subject matter of claim

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41 and in fact states the necessity of being within the weight ratios recited in Ichikawa et al. The Examiner has provided no reasons why one can ignore these specific teachings. Thus, Ichikawa et al. in view of Mimori et al. and Dias et al. does not teach or suggest the claimed invention as recited in claim 41 of the present application, and this rejection should be reversed.

d) The patentability of claims 42 and 43.

Claim 42 is dependent on claim 39, and recites that the granules have attached a carbonizable binder.

Claim 43 is dependent on claim 39, and recites that the product has a particle size of from about 2 to about 5 microns.

The arguments set forth above with respect to the patentability of claim 1 (for Ichikawa et al. and Mimori et al.) and claim 39 (for Ichikawa et al., Mimori et al., and Dias et al.) apply equally here, and the arguments are incorporated in their entirety by reference herein.

Accordingly, Ichikawa et al., Mimori et al., and Dias et al. do not teach or suggest claims 42 and 43 of the present application, and this rejection should be reversed.

e) The patentability of claim 46.

Claim 46 recites that the granulated carbonaceous product includes carbonaceous particles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules, wherein at least one carbonizable binder is attached onto the carbonaceous particles.

The arguments set forth above with respect to the patentability of claim 39 over

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Ichikawa et al., Mimori et al., and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

Although Ichikawa et al. describes adding a binder to carbon black particles and heat treating the mixture, Ichikawa et al. does not teach or suggest mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent. Furthermore, for the reasons set forth above, Dias et al. is not combinable with Ichikawa et al. Accordingly, Ichikawa et al., Mimori et al., and Dias et al. do not teach or suggest claim 46 of the present application, and this rejection should be reversed.

E. The Examiner's rejection of claims 39-43 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al. or the Abstract of JP 54041296, and further in view of Dias et al.

1. The Examiner's Rejection

The Examiner acknowledges that the claimed invention differs from Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al. or the Abstract of JP 54041296. The Examiner states that Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al. or the Abstract of JP 54041296 does not teach or suggest the use of an aqueous solvent. However, the Examiner asserts that Dias et al. shows that the use of water allows carbon particles to be coated with binders and is used with phenolic resin. Accordingly, the Examiner concludes that it would have been obvious to use water in Ichikawa et al. in view of the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al. or the Abstract of JP 54041296.

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For the following reasons, the Examiner's rejection should be reversed.

2. The Appellants' Reply to the Examiner's rejection of claims 39-43 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of either the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al. or the Abstract of JP 54041296 and further in view of Dias et al.

- a) The patentability of claim 39.

As noted, claim 39 recites a granulated carbonaceous product comprising carbonaceous particles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules, at a temperature of from about 400° C to less than 800° C.

The arguments set forth above with respect to the patentability of claim 39 over Ichikawa et al. in view of Mimori et al. and further in view of Dias et al., and claims 12 and 13 over JP 54041296 and claim 1 over JP 02193066 or Holmes et al., and Mikes et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

As indicated, there is no motivation to modify Ichikawa et al. which relates to a different product and is formed under different conditions. Ichikawa et al. specifically states that these conditions significantly affect the type of product formed. None of the cited secondary references, which are numerous, would properly motivate one skilled in the art to modify Ichikawa et al. since they relate to different materials and different conditions. Furthermore, as indicated above, there is also the problem of the Examiner

relying on Abstracts of foreign references. Instead of detailing every single argument set forth above in this Appeal Brief, the appellants are relying on and incorporating by reference the arguments set forth above which clearly shows the differences between the claimed invention and the combination of references relied upon by the Examiner, especially the arguments provided with respect to claim 39 as set forth above. For the reasons set forth above, one skilled in the art would not consider these references to teach or suggest claim 39 of the present application, and this rejection should be reversed.

b) The patentability of claim 40.

As noted, claim 40 is dependent on claim 39, and recites that the carbon particles are carbon black and the carbonizable binder is a water-compatible phenolic resin, and wherein the mixture includes 100 parts by weight of carbon black and from about 5 to about 100 parts by weight of the carbonizable binder.

The arguments set forth above with respect to the patentability of claim 40 over Ichikawa et al., Mimori et al. and Dias et al., and claim 37 over Ichikawa et al., in view of the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al., or the Abstract of JP 54041296 and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

As stated in significant detail above, the appellants have shown why one skilled in the art, even if one could combine the secondary references, would not consider the claimed invention obvious. Simply, Ichikawa et al. relates to a different product, namely a granulated product using carbon black which is simply not shown in many of the secondary references. In addition, Ichikawa et al. relates to the preparation of a product using very strict process conditions wherein Ichikawa et al. specifically warns that if

these conditions are not followed, the product will not successfully be made. Furthermore, the Examiner relies on foreign documents where only English Abstracts were relied upon. In addition, Dias et al. which is non-analogous art, uses water which is the complete opposite of Ichikawa et al. Finally, the various weight ratios of products used in some of the claims simply is not shown in Ichikawa et al. or any other cited references and the attachment of carbonizable binder is not taught or suggested. The present Appeal Brief provides significant detailed comments to explain these differences and why one skilled in the art would not be motivated to combine the references or make the radical substitutions to Ichikawa et al. as argued by the Examiner.

For the reasons set forth above, this rejection should be reversed.

c) The patentability of claim 41.

As noted, claim 41 recites a granulated carbonaceous product including carbonaceous particles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules, wherein the mixture includes 100 parts by weight of carbon black and from about 5 to less than 50 parts by weight of at least one carbonizable binder.

The arguments set forth above with respect to the patentability of claim 41 over Ichikawa et al., Mimori et al., and Dias et al., and claim 40 over Ichikawa et al., in view of the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al., or the Abstract of JP 54041296 and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

As stated in significant detail above, the appellants have shown why one skilled in

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the art, even if one could combine the secondary references, would not consider the claimed invention obvious. Simply, Ichikawa et al. relates to a different product, namely a granulated product using carbon black which is simply not shown in many of the secondary references. In addition, Ichikawa et al. relates to the preparation of a product using very strict process conditions, wherein Ichikawa et al. specifically warns that if these conditions are not followed, the product will not successfully be made. Furthermore, the Examiner relies on foreign documents where only English Abstracts were relied upon. In addition, Dias et al., which is non-analogous art, uses water which is the complete opposite of Ichikawa et al. Finally, the various weight ratios of products used in some of the claims simply is not shown in Ichikawa et al. or the other cited references. The present Appeal Brief provides significant detailed comments to explain these differences and why one skilled in the art would not be motivated to combine the references or make the radical substitutions to Ichikawa et al. as argued by the Examiner.

For the reasons set forth above, this rejection should be reversed.

d) The patentability of claims 42 and 43.

As noted, claims 42 and 43 are dependent on claim 39. Claim 42 recites that the granules have attached a carbonizable binder, and claim 43 recites that the product has a particle size from about 2 to about 5 microns.

The arguments set forth above with respect to the patentability of claims 42 and 43 over Ichikawa et al., Mimori et al., and Dias et al. and claim 39 over Ichikawa et al., in view of the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al., or the Abstract of JP 54041296 and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

As stated in significant detail above, the appellants have shown why one skilled in the art, even if one could combine the secondary references, would not consider the claimed invention obvious. Simply, Ichikawa et al. relates to a different product, namely a granulated product using carbon black which is simply not shown in many of the secondary references. In addition, Ichikawa et al. relates to the preparation of a product using very strict process conditions, wherein Ichikawa et al. specifically warns that if these conditions are not followed, the product will not successfully be made. Furthermore, the Examiner relies on foreign documents where only English Abstracts were relied upon. In addition, Dias et al., which is non-analogous, uses water which is the complete opposite of Ichikawa et al. Finally, the various weight ratios of products used in some of the claims simply is not shown in Ichikawa et al. or the other cited references. The present Appeal Brief provides significant detailed comments to explain these differences and why one skilled in the art would not be motivated to combine the references or make the radical substitutions to Ichikawa et al. as argued by the Examiner.

For the reasons set forth above, this rejection should be reversed.

e) The patentability of claim 46.

Claim 46 recites a granulated carbonaceous product including carbonaceous particles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules, wherein at least one carbonizable binder is attached onto the carbonaceous particles.

The arguments set forth above with respect to the patentability of claim 46 over Ichikawa et al., Mimori et al., and Dias et al. and claim 39 over Ichikawa et al., in view of

the Abstract of JP 02193066 or Holmes et al., Mikes et al., and either Mimori et al., or the Abstract of JP 54041296 and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein.

As stated in significant detail above, the appellants have shown why one skilled in the art, even if one could combine the secondary references, would not consider the claimed invention obvious. Simply, Ichikawa et al. relates to a different product, namely a granulated product using carbon black which is simply not shown in many of the secondary references. In addition, Ichikawa et al. relates to the preparation of a product using very strict process conditions, wherein Ichikawa et al. specifically warns that if these process conditions are not followed, the product will not successfully be made. Furthermore, the Examiner relies on foreign documents where only English Abstracts were relied upon. In addition, Dias et al., which is non-analogous art, uses water which is the complete opposite of Ichikawa et al. Finally, the various weight ratios of products used in some of the claims simply is not shown in Ichikawa et al. or the other cited references. The present Appeal Brief provides significant detailed comments to explain these differences and why one skilled in the art would not be motivated to combine the references or make the radical substitutions to Ichikawa et al. as argued by the Examiner.

For the reasons set forth above, this rejection should be reversed.

F. The Examiner's rejection of claims 41 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Dias et al.

1. The Examiner's Rejection

The Examiner acknowledges that the claimed invention differs from Ichikawa et al. The Examiner admits that Ichikawa et al. does not teach or suggest the use of an

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aqueous solvent. However, the Examiner asserts that Dias et al. at column 2, lines 24-28, describes that the use of water allows carbon particles to be coated with binders and is used with phenolic resin. Accordingly, the Examiner concludes that it would have been obvious to use water in Ichikawa et al.

For the following reasons, the Examiner's rejection should be reversed.

2. The Appellants' Reply to the Examiner's rejection of claims 41 and 46 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Dias et al.

a) The patentability of claim 41.

Claim 41 recites a granulated carbonaceous product including carbonaceous particles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules, wherein the mixture includes 100 parts by weight of carbon black and from about 5 to less than 50 parts by weight of at least one carbonizable binder.

The arguments set forth above with respect to the patentability of claim 41 over Ichikawa et al. and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein. Simply, Ichikawa et al. strictly warns against forming a product outside the weight ratios described in Ichikawa et al. The Examiner provides no explanation why one skilled in the art would modify Ichikawa et al. to use the weight ratio set forth in claim 41. Dias et al. provides no teaching or suggestion to use these weight ratios especially since it relates to a different product which is formed differently from Ichikawa et al. Accordingly, it is not understood what motivation exists to modify

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Ichikawa et al. in view of Dias et al., especially when Ichikawa et al. warns against using different weight ratios and against using an aqueous solvent. Accordingly, Ichikawa et al. in view of Dias et al. does not teach or suggest claim 41 of the present application, and this rejection should be reversed.

b) The patentability of claim 46.

Claim 46 recites a granulated carbonaceous product comprising carbonaceous particles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules, wherein at least one carbonizable binder is attached onto the carbonaceous particles.

The arguments set forth above with respect to the patentability of claim 46 over Ichikawa et al. and Dias et al. apply equally here, and the arguments are incorporated in their entirety by reference herein. Again, there is no motivation for one to modify Ichikawa et al. in view of Dias et al. since they relate to different products and processes. Only the improper use of hindsight would permit the modification of Ichikawa et al. as proposed by the Examiner in view of Dias et al. Accordingly, Ichikawa et al. in view of Dias et al. does not teach or suggest claim 46 of the present application, and this rejection should be reversed.

G. The Examiner's rejection of claims 39, 40, 42, and 43 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Dias et al., and further in view of either Mimori et al. or the Abstract of JP 54041296.

1. The Examiner's Rejection

The Examiner acknowledges that the claims of the present application differ from

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Ichikawa et al. in view of Dias et al. The Examiner admits that Ichikawa et al. in view of Dias et al. does not teach or suggest the use of a temperature of from about 400° C to less than 800° C. However, the Examiner asserts that Mimori et al. shows that carbonizing at 500° C allows carbon to become hydrophilic. Furthermore, the Examiner asserts that the Abstract of JP 54041296 shows that heating carbon black and a carbonizable binder at 500° C forms a support useful for adsorption. Accordingly, the Examiner concludes that it would have been obvious to use a temperature of less than 800° C in Ichikawa et al. in view of Dias et al.

For the following reasons, the Examiner's rejection should be reversed.

2. The Appellants' Reply to the Examiner's rejection of claims 39, 40, 42, and 43 under 35 U.S.C. §103(a) as being unpatentable over Ichikawa et al. in view of Dias et al., and further in view of either Mimori et al. or the Abstract of JP 54041296.

a) The patentability of claims 39.

As noted, claim 39 recites a granulated carbonaceous product including carbonaceous particles and at least one carbonized binder, produced by the process of mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent; granulating the mixture to form granules; and carbonizing the granules, at a temperature of from about 400° C to less than 800° C.

The arguments set forth above with respect to the patentability of claim 39 over Ichikawa et al., in view of Dias et al., and further in view of either Mimori et al. or the Abstract of JP 54041296, apply equally here, and the arguments are incorporated in their entirety by reference herein. In summary, Ichikawa et al. teaches away from carbonizing

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the granules at a temperature of less than 800° C. Furthermore, the material of Ichikawa et al. is different from Mimori et al. as well as the other secondary references relied upon by the Examiner. In addition, the processing of the material of Ichikawa et al. is quite different from the use of an aqueous solvent in Dias et al. Also, the Japanese Abstract relates to a different material. Furthermore, the Examiner is relying on an English Abstract as opposed to the full Japanese document. With the numerous references relied upon by the Examiner, it is clear that the Examiner is attempting a mixing and matching of various parameters to do a radial modification of Ichikawa et al. in order to assert that the claimed invention is obvious in view of numerous references. As stated previously, there clearly is no motivation to modify Ichikawa et al. in view of its different processing conditions and Ichikawa et al.'s warning that an unsuccessful product will be formed. Further, the materials used in the secondary references simply are not the same as the granulated material of Ichikawa et al. Therefore, Ichikawa et al. is not combinable with Mimori et al. or the Abstract of JP 54041296. Accordingly, Ichikawa et al. in view of Dias et al., Mimori et al., or the Abstract of JP 54041296 does not teach or suggest claim 39 of the present application, and this rejection should be reversed.

b) The patentability of claim 40.

As noted, claim 40 is dependent on claim 39, and recites that the carbon particles are carbon black and the carbonizable binder is a water-compatible phenolic resin, and wherein the mixture includes 100 parts by weight of carbon black and from about 5 to about 100 parts by weight of the carbonizable binder.

The arguments set forth above with respect to the patentability of claim 40 over Ichikawa et al. in view of Dias et al. and further in view of either Mimori et al. or the

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Abstract of JP 54041296 apply equally here, and the arguments are incorporated in their entirety by reference herein. In summary, Ichikawa et al. in view of Dias et al., Mimori et al., or the Abstract of JP 54041296 does not teach or suggest a mixture which includes 100 parts by weight of carbon black and from about 5 to about 100 parts by weight of the carbonizable binder. Accordingly, these references do not teach or suggest claim 40 of the present application, and this rejection should be reversed.

c) The patentability of claim 42 and 43.

As noted, claims 42 and 43 are dependent on claim 39. Claim 42 recites that the granules have attached a carbonizable binder and claim 43 recites that the product has a particle size of from about 2 to about 5 microns.

The arguments set forth above with respect to the patentability of claims 42 and 43 over Ichikawa et al. in view of Dias et al. and further in view of either Mimori et al. or the Abstract of JP 54041296 apply equally here, and the arguments are incorporated in their entirety by reference herein. For the reasons set forth above previously, one skilled in the art would not consider Ichikawa et al., Dias et al., Mimori et al., or the Abstract of JP 54041296 to teach claims 42 and 43 of the present application. Thus, this rejection should be reversed.

IX. CONCLUSION

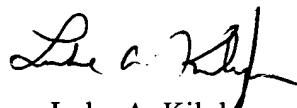
For at least the reasons discussed above, it is respectfully submitted that all of the Examiner's rejections of the pending claims are in error and should be reversed.

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If there is any fee due in connection with the filing of this Brief on Appeal, please charge the fee to Deposit Account No. 03-0060.

Respectfully submitted,

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Enclosure: Appendix

APPENDIX

Claim 1. A granulated product comprising: carbonaceous particles and at least one carbonized synthetic resin, carbonized pitch component, or mixtures thereof, wherein said granulated product has attached at least one organic group.

Claim 2. The granulated product of claim 1, wherein said carbonaceous particles have a specific surface area of from about 15 to about 550 m²/g and a total micropore volume of from about 0.01 to about 2.0 ml/g.

Claim 3. The granulated product of claim 1, wherein said granulated product has a ratio V_{0.5}/V_{1.0} of about 0.4 or smaller, wherein V_{0.5} is the nitrogen gas adsorption volume at a relative pressure P/P₀ of 0.5 and V_{1.0} is the nitrogen gas adsorption volume at a relative pressure P/P₀ of about 1.0 at a nitrogen gas adsorption isotherm.

Claim 4. The granulated product of claim 1, wherein said carbonaceous particles are carbon black particles.

Claim 5. The granulated product of claim 1, wherein said granulated product comprises a carbonized synthetic resin and said synthetic resin is a phenol resin, a furan resin, a furfural resin, a divinyl benzene resin, a urea resin, or a combination thereof.

Claim 6. The granulated product of claim 1, wherein said granulated product comprises a carbonized pitch component and said pitch component is at least one of a toluene-soluble pitch component or a benzene-soluble pitch component, or a combination thereof.

Claim 7. The granulated product of claim 6, wherein said pitch component comprises a petroleum pitch, a coal-tar pitch, a liquefied coal oil, or a combination thereof.

Claim 8. The granulated product of claim 1, wherein said carbonaceous particles comprise 100 parts by weight carbon black and said mixture comprises from about 5 to about

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500 parts by weight said synthetic resin, pitch component, or both.

Claim 9. The granulated product of claim 1, wherein said organic group contains an ionic group or an ionizable group.

Claim 10. The granulated product of claim 1, wherein said carbonaceous particles are substantially spherical.

Claim 12. The granulated product of claim 1, wherein said carbonized synthetic resin, carbonized pitch component, or carbonized synthetic resin/pitch component mixture has been carbonized by heating to a temperature of from about 400° C to less than 800° C.

Claim 13. The granulated product of claim 1, wherein said carbonized synthetic resin, carbonized pitch component, or carbonized synthetic resin/pitch component mixture has been carbonized by heating to a temperature of from about 400° C to about 700° C.

Claim 36. The granulated product of claim 1, wherein said granulated product has a ratio L_{\min}/L_{\max} of a minor axis diameter L_{\min} to a major axis diameter L_{\max} of from about 0.75 to about 1.25, a particle diameter of from about 2 to about 200 microns, a specific surface area of from about 10 to about 650 m^2/g , and a total micropore volume of from about 0.08 to about 2.0 ml/g .

Claim 39. A granulated carbonaceous product comprising carbonaceous particles and at least one carbonized binder, produced by the process of:

mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent;

granulating said mixture to form granules; and

carbonizing said granules, at a temperature of from about 400° C to less than 800° C.

Claim 40. The product of claim 39, wherein the carbon particles are carbon black and the carbonizable binder is a water-compatible phenolic resin, and wherein the mixture comprises 100

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parts by weight of carbon black and from about 5 to about 100 parts by weight of said carbonizable binder.

Claim 41. A granulated carbonaceous product comprising carbonaceous particles and at least one carbonized binder, produced by the process of:

mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent;

granulating said mixture to form granules; and

carbonizing said granules, wherein the mixture comprises 100 parts by weight of carbon black and from about 5 to less than 50 parts by weight of at least one carbonizable binder.

Claim 42. The granulated carbonaceous product of claim 39, wherein said granules have attached a carbonizable binder.

Claim 43. The granulated carbonaceous product of claim 39, wherein said product has a particle size of from about 2 to about 5 microns.

Claim 46. A granulated carbonaceous product comprising carbonaceous particles and at least one carbonized binder, produced by the process of:

mixing the carbonaceous particles with at least one carbonizable binder and an aqueous solvent;

granulating said mixture to form granules; and

carbonizing said granules, wherein said at least one carbonizable binder is attached onto said carbonaceous particles.